Inquiry into Ecosystem Decline in Victoria

by the
Environment and Planning Committee
of the Victorian Parliament

Submission by the
Invasive Species Council

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Document details

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About the Invasive Species Council

The Invasive Species Council was formed in 2002 to advocate for stronger laws, policies and programs to keep Australian biodiversity safe from weeds, feral animals, exotic pathogens and other invaders. It is a not-for-profit charitable organisation with over 3000 supporters, funded predominantly by donations from supporters and philanthropic organisations.

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1. Introduction

The Invasive Species Council is a national community organisation that advocates for stronger laws, policies and programs to protect the Australian environment from invasive species. We are guided by the latest science and have a particular focus on prevention and emerging or future threats.

Our response in this submission is structured by the categories provided by the inquiry's terms of reference referred to in Attachment 2. The submission concentrates on how invasive species contribute to ecosystem decline in Victoria. The final section offers 18 recommendations.

2. TOR a: The extent of the decline of Victoria's biodiversity and the likely impact on people, particularly First Peoples, and ecosystems, if more is not done to address this, including consideration of climate change impacts

Research shows invasive species are a major threat to Australia's wildlife – at least as great as habitat loss and much greater than climate change. In 2018 Kearney et al. undertook a comprehensive review of threats to terrestrial species listed as threatened under Australia's *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999*. Following accepted global categories of threat, they found that invasive species affect the largest number of listed terrestrial species (1257 species, or 82% of all threatened species). This result is summarised in Figure 1. Invasive species are also likely the highest, or one of the highest, threats to Victorian listed species.

	Total (1533)	Invertebrates (48)	Plants (1212)	Vertebrates (272)	Amphibians (29)	Birds (84)	Fish (34)	Mammals (74)	Reptiles (51)	Critically Endangered (178)	Endangered (646)	Vulnerable (709)
Invasive species	82%	79.2%	79.5%	94.1%	100%	95.2%	97.1%	97.3%	82.4%	80.9%	86.5%	78.1%
Ecosystem modifications	74.1%	79.2%	75.7%	66.5%	65.5%	72.6%	79.4%	62.2%	54.9%	64.6%	79.1%	71.9%
Agricultural activity	56.9%	72.9%	53.5%	69.9%	69%	82.1%	47.1%	73%	60.8%	51.1%	60.2%	55.4%
Human disturbance	38.4%	20.8%	40.3%	33.1%	51.7%	35.7%	38.2%	27%	23.5%	34.8%	43%	35%
Climate change	34.8%	45.8%	32.1%	44.9%	44.8%	56%	55.9%	37.8%	29.4%	43.3%	36.2%	31.3%
Transportation	30.3%	14.6%	34%	16.9%	41.4%	16.7%	2.9%	17.6%	11.8%	27.5%	34.4%	27.4%
Overexploitation	27.4%	50%	24.6%	36%	48.3%	40.5%	52.9%	28.4%	21.6%	25.8%	26.3%	28.8%
Urban development	22.2%	31.2%	21.4%	24.6%	24.1%	26.2%	29.4%	14.9%	33.3%	23.6%	22.6%	21.6%
Energy production	18.9%	10.4%	18.2%	23.5%	10.3%	20.2%	47.1%	16.2%	31.4%	19.7%	20.4%	17.2%
Pollution	17.8%	25%	16.2%	23.9%	44.8%	19%	61.8%	6.8%	19.6%	15.7%	21.8%	14.7%
Geological Events	1%		1.3%							0.6%	0.6%	1.6%

Figure 1: Prevalence of threats to nationally listed threatened species (Kearney et al. 2018)

Naturalised plant species (non-indigenous plants from overseas or elsewhere in Australia that have established in the wild) already account for 25% of the total plant species in Victoria and every year

on average another 10 species become established (CES 2018). This rate is increasing (CES 2018). Of the 1,451 naturalised plant taxa, 1,235 species (85%) are environmental weeds (CES 2018).

Of Victoria's 22 introduced mammals and 23 established exotic birds (DELWP 2020a), many like foxes, rabbits and cats are already widespread, while others like deer and pigs are expanding their range quickly. Climate change is expected to make invasive species' impacts worse.

At current rates, invasive species – including pathogens such as phytophthora and myrtle rust – will continue to damage our native species and ecosystems, pushing many further towards extinction.

The impacts of invasive species are recognised through listing invasive species threats as 'threatening processes' at both the state and national level.

Nationally, nine of the 21 threatening processes listed under the EPBC Act concern invasive animals, two involve invasive plants, one is a pathogen and one (novel biota) encompasses all other harmful invasive species.

At the state level, 21 of the 43 potentially threatening processes listed under the *Flora and Fauna Guarantee* (FFG) *Act 1988* relate to invasive species. These include threats posed by feral horses, goats, deer, European bees, cats, foxes, carp and rabbits. Cattle grazing in the Victorian Alps is also listed. Plant threats include spartina, blackberry, tall wheat-grass, spartina and 'environmental weeds' in general. It includes the spread of the endemic species coast and sallow wattle and sweet pittosporum outside of their natural range. Pathogens identified as threats include chytrid fungus and phytophthora. The introduction to Victorian waters of exotic organisms and live fish outside of their natural range are listed along with the threat of Argentine ant, European honeybee and large earth bumblebee.

All listed threats, except for the large earth bumblebee and the generic threats of environmental weeds, aquatic organisms and live fish are already established in Victoria. The potentially threatening processes listed under the FFG Act are not comprehensive and there are many additional invasive species threats in Victoria that would qualify for listing, including those already present in Victoria as well as likely threats from other parts of Australia and overseas.

The preparation of action statements to address a potentially threatening process is optional. At present are only four action statements prepared for the 21 invasive species related potentially threatening processes. These are for predation by cats, predation by fox, the introduction of exotic organisms to Victorian marine waters and the introduction of live fish into Victorian rivers. The statements were prepared between 1997 and 2003. There has been no clear process for reviewing action statement implementation.

Over the past three years there have been three main assessments related to invasive species in Victoria:

1. The Department of Environment, Land Water and Planning's (DELWP) assessment of the status of environmental weeds, resulting in the Advisory List of Environmental Weeds in Victoria
2. A Victorian Government Parliamentary Inquiry by the Environment, Natural Resources and Regional Development Committee (ENRRDC) into the control of invasive animals on Crown land
3. The Commissioner for Environmental Sustainability's (CES) 2018 State of the Environment (SoE) Report.

In each case the assessment determined that invasive species in Victoria are a concerning issue and their impact upon the state's ecosystems is significant, showing a trend for increased impact. Details of these assessments are provided below.

DELWP Advisory List of Environmental Weeds in Victoria

In 2018 DELWP released an Advisory List of Environmental Weeds in Victoria (White et al. 2018). The list includes most of the 1451 naturalised plants in Victoria along with species native to Victoria and those naturalised but since eradicated from the wild.

Environmental weeds are a subcategory of invasive plant species that threaten Victoria's biodiversity – they may displace native species, alter ecological processes such as fire and soil erosion patterns, or alter the genetic composition of native plant populations (Carr et al. 1992, Carr 1993).

The assessment that informed the list determined that there are at least 1235 environmental weed taxa (species, subspecies, varieties, hybrids) established in native vegetation in Victoria —almost double the number recognised 25 years ago by Carr (1993) (White et al. 2018). In the last 100 years an average of about 10 new plants have established in Victoria each year (CES 2018). Australia-wide, about 20 new plant species have naturalised each year (Dodd et al. 2015).

ENRRDC Parliamentary inquiry into the control of invasive animals on Crown land

In 2017 the Parliament of Victoria ENRRDC reported on their inquiry into the control of invasive animals on Crown land. The terms of reference focussed on vertebrate pests with the potential to be managed by shooting. Their findings included:

- 'It is clear that more needs to be done to manage invasive animals. However, it is less clear exactly what should be done'
- 'Public land managers are failing to control invasive species on public land'
- 'There is a lack of robust data about the extent of the invasive animal problem and the effectiveness of different control methods. Some work is currently underway to improve our understanding but the results are not yet available. Further work in this area will be important for future policy development'.

The inquiry found that the impacts of these invasive animals on the environment and on private land assets were significant, the impacts were increasing, and the legislation and management arrangements were complex.

The committee made 33 recommendations, a number of which are counter-productive to the goal of reducing the environmental impact of pest animals on public land. These include the promotion of recreational hunting despite its questionable benefit to pest control (ISC 2012a).

CES State of the Environment Report

The Victorian CES delivered the State of the Environment (SoE) Report in 2018. The report documented trends in six invasive plant and animal indicators, summarised in Figure 2. The results for these indicators were:

- European carp, deer and horses, invasive terrestrial plants and invasive terrestrial animals – status poor and declining
- Invasive freshwater plants – status unknown.

The data for assessing four of these indicators was 'fair' or 'poor', while the data for the other two indicators was deemed 'good'.

The SoE Report also found that the policy and management challenges for conserving Victoria's biodiversity are:

- Reducing the rising number and distribution of invasive species across public and private land and water systems. Invasive species are causing habitat degradation and impacting on native species populations
- The lack of an integrated and well-designed monitoring and assessment program to answer key biodiversity, ecological and management questions poses a persistent challenge to conserving Victoria's natural assets
- A lack of data makes it difficult to establish the distribution and abundance of invasive plants and animals.

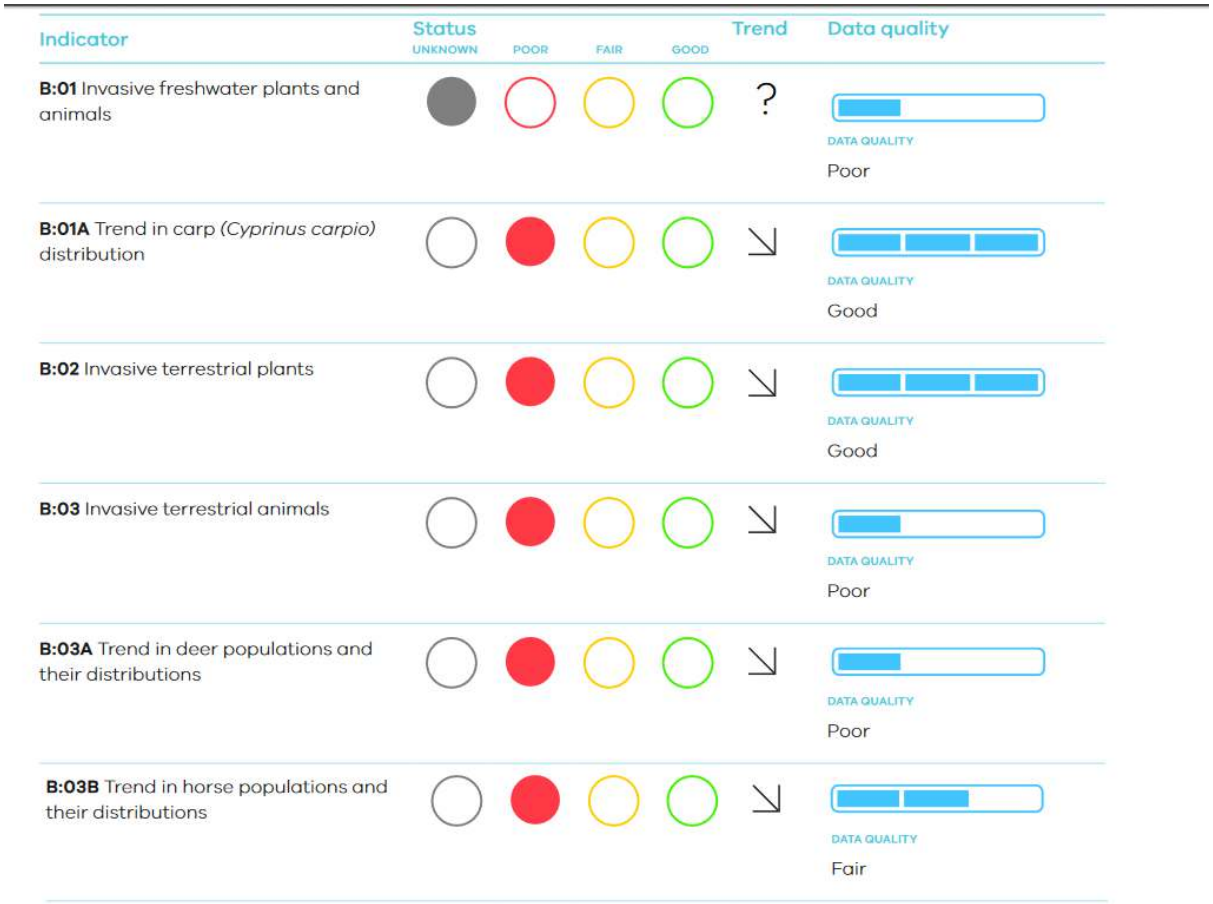

Figure 2: SoE Report – summary of indicator assessment relating to invasive species

Climate change

Climate change has already resulted in changes in invasive plant and animal behaviour, with increases in extent, range and severity of impact. This is in line with predictions from 10 years ago (Low 2011 p35, Dunlop and Brown 2008).

Under climate change some species will decline and others will thrive. Some invasive species will benefit in certain places and decline in others. This does not mean there will be an overall balancing out: for a variety of reasons invasive species are likely to cause more harm under climate change.

One reason for invasive species increasing under climate change is because many invasive species are generalists and highly adaptable, allowing them to tolerate or take advantage of changes and disturbance (Rejmanek 1996, Sutherst et al. 1995). An increase in extreme events will offer new opportunities for invasive species to proliferate and spread – weeds colonise bare patches after droughts, fires and cyclones; and foxes and cats prey on animals whose shelter is destroyed by those events (Friend 1993, Clarke 2008, Low 2008). Past experience has also shown that extreme events promote invasions, such as the floods of the 1970s spreading carp (*Cyprinus carpio*) throughout the Murray-Darling system (Koehn et al., 2000). Carp are now the most abundant big fish in the Murray-Darling.

Native species and ecosystems stressed by climate change will also be less competitive and more vulnerable to threats by invasive species. Stressed plants, for example, are more vulnerable to diseases like phytophthora dieback or displacement by weeds.

The effects of climate change have recently been experienced by Victorian people, plants and animals. Over the past two years Victoria has experienced lower than average rainfall across much of the northern area of the state, and in 2019 recorded the fifth highest average temperatures on record (Bureau of Meteorology 2019). In late 2019 Victoria saw some of the most devastating bushfires in the state's history. Ecologists estimate these fires killed 3 billion animals nationwide (WWF 2020), while the aftermath is likely to have claimed many more.

After the fires, the impact of exotic herbivores – including pigs, deer and horses – in competing with native animals was recognised, and an aerial shooting program was implemented in fire-affected areas in Victoria's north-east and Alpine areas. Additionally, the impact of cats and foxes on vulnerable wildlife was also targeted via the post-fire intensification of predator baiting programs in fire-affected areas.

The 2019 fires have been linked to climate change and scientific predictions show that there will be more of these types of events in the future (Clarke et al. 2019).

Human responses to climate change are also likely to provide new opportunities for invasive species – for example, with the introduction of weedy biofuel crops, and the spread of weeds introduced in fodder after droughts and other extreme events. If farmers are under economic stress due to extreme weather events and governments have other climate-related budgetary demands, we can expect less focus on weed and pest control.

3. TOR b: Adequacy of the legislative framework protecting Victoria's environment, including grasslands, forests and the marine and coastal environment, and native species

Existing legislation

Victoria's legislative framework to manage invasive species is a mixed bag. Measures are often not specifically formulated or effective in managing invasive species to protect ecological values. Instead, the focus of invasive species management often reflects of interests of agriculture, recreational hunting and fishing lobbyists, and plant and bird collectors. This has resulted in a hodgepodge of confusing and ineffectual legislation. Despite this, Victoria has some important

policies which could provide a framework for invasive species legislation, a strategy other states such as Queensland have adopted.

Figure 3 provides one example of the complexity associated with legislative regulation relating to just one group of invasive species, deer (Victorian Deer Control Strategy, DELWP 2020b).

While this complexity may be partly rectified with changes foreshadowed in the recently adopted Victorian Deer Control Strategy (DEWLP 2020b), this example shows that while deer are declared 'protected wildlife' and a 'game species' under the Wildlife Act, under the *Catchment and Land Protection* (CaLP) *Act 1994* and *National Parks Act 1975* deer must be managed. Deer are also listed as a 'potentially threatening process' under the *Flora and Fauna Guarantee Act 1988*, however such a listing does not compel any action by the state or landowners.

Under the Wildlife Act a 'Governor in Council Order' has made a temporary allowance for private landholders to manage deer without seeking a permit. But public land managers, such as Parks Victoria and local governments, are currently required to apply for authorisation under the Wildlife Act to manage deer on public land. The protected game status signals to landholders that there is no need to control deer on their land unless their own interests are being impacted.

As invasive species occur in all environments and across all land tenures, governance arrangements are also similarly complex and confused.

STATUS	LEGISLATION	DEER SPECIES	INTENT/OBLIGATION
Protected wildlife	*Wildlife Act 1975*	Chital, Fallow, Hog, Red, Rusa, Sambar, Sika, Sika-Red hybrids and Wapiti	Offence to hunt, take, or destroy protected wildlife unless authorised.
Game Species	*Wildlife Act 1975*	Chital, Fallow, Hog, Red, Rusa and Sambar	Can be hunted by licensed game hunters according to prescribed methods, seasons (Hog Deer only) and time of day.
Problem deer on private land (unprotected species)	Governor in Council Order under the *Wildlife Act 1975*	All deer species, except Hog Deer	Problem deer on private property can be controlled without a licence or permit.
Prohibited pest animal	*Catchment and Land Protection Act 1994*	All species except: Chital, Fallow, Hog, Red, Rusa, Sambar, Sika, Sika-Red hybrids and Wapiti	This declaration prohibits the bringing into Victoria, keeping, selling, or releasing of these animals without a permit. Government has a responsibility to take all reasonable steps to control prohibited pest animals on any land in the State.
Exotic fauna	*National Parks Act 1975*	All species of deer	*The National Parks Act 1975* requires the extermination or control of exotic fauna (including deer) in National and State parks, Wilderness Parks and other reserves.
Potentially threatening process	*Flora and Fauna Guarantee Act 1988*	Sambar Deer	Recognises that Sambar Deer pose a significant threat to the survival and evolutionary development of numerous plant taxa and ecological communities.

Figure 3: Summary of the legal status of deer in Victoria (DELWP 2020b)

The main legislation for pest plants and animal management in Victoria is the CaLP Act. Under this Act plant and animal species can be declared 'noxious weeds' and 'pest animals'. The Act prohibits the movement and sale of noxious weeds anywhere in the state, and covers weed seeds occurring as contaminants in seed lots, plant products or on vehicles, machinery or animals. The CaLP Act also regulates the importation, movement, keeping, selling and releasing of declared pest animals in

Victoria. The CaLP Act also requires landowners to manage declared noxious weeds and pest animals on their land.

However only 129 plants are listed under the CaLP Act – approximately 10% of all environmental weeds in Victoria (White et al. 2018). The remaining 90% are able to be bought, sold and moved around the state without controls.

In late 2014 an *Invasive Species Control Bill* was proposed for Victoria but failed to pass parliament and has not been reintroduced. While this Bill would have provided broader powers than current legislation, they were highly discretionary, and the Bill failed to include best-practice biosecurity measures now adopted by Queensland, NSW and Tasmania (ISC 2012b). The new powers cannot be used for species listed under the Wildlife Act, including deer, exotic game birds and native plants which may be spread to become invasive. The listing system does not include a 'duty of care' requirement and a 'permitted list' approach that is widely recognised as the best mechanism to prevent the spread of new invasive species. The discretionary nature of the Bill's powers means that the Bill does not have sufficient powers or obligations and lacks a strong prevention focus. The resources available would largely determine the extent to which the new law would be applied rather than the requirement to properly manage risks from invasive species. The consultation process for the bill was woeful, with important issues raised by the community ignored.

To rectify these deficiencies, Victoria needs the legislative clout to implement the relatively sensible goals and actions in the state's Biosecurity Strategy and Invasive Species and Animals Policy Framework (described in the following section).

Existing policy

Guidance on invasive species policy is provided by four key state frameworks. These inform state government practice and – to varying extents – are incorporated into documents produced by catchment management authorities. Local governments sometimes also develop their own policies reflecting these overarching strategies. These four policies are:

- Invasive Plants and Animals Policy Framework (IPAPF), 2010
- Victorian Biosecurity Strategy, 2009
- Protecting Victoria's Environment – Biodiversity 2037 (Biodiversity Plan)
- Sustainable Hunting Action Plan 2016–2020.

In particular, the IPAPF represents the Victorian Government's approach to managing existing and potential invasive species across the whole of Victoria. It prioritises actions based on a biosecurity approach that reflects the Victorian Biosecurity Strategy and aligns with the logic described in Figure 4. While this approach is logical and cost-effective, Victoria's current legislation does not align with or support this logic.

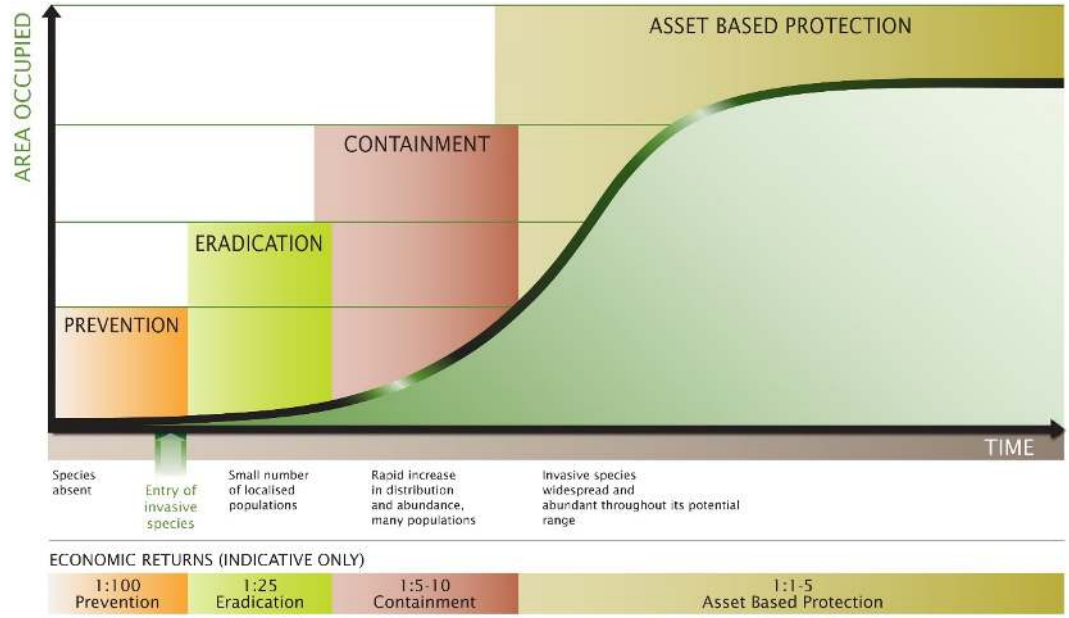

Figure 4: Invasion curve for invasive species management (Victorian Government, 2010)

4. TOR c: Adequacy and effectiveness of government programs and funding protecting and restoring Victoria's ecosystems

Government programs

Agriculture Victoria has responsibility for overall invasive species management, including policy and strategy. This needs to be reconsidered. The objectives and methods needed to manage the state's 3 million hectares of public conservation reserves differs from those needed to manage agricultural land – Agriculture Victoria's primary area of expertise.

The results of the assessments outlined previously, including the 2018 SoE Report and the 2017 ENRRDC Report, clearly show management approaches have been inadequate to address invasive species impacts. Each assessment found that, in most cases, invasive species impacts are getting worse.

These assessments also identified that there are significant knowledge gaps on invasive species, meaning that in many cases we don't even have the data to begin measuring progress.

While Victoria's Biodiversity Plan has objectives for involving Traditional Owners in biodiversity-related work, to date there has been no clear program to achieve these goals. Invasive species management could provide one important opportunity.

Costs

It's currently unknown how much invasive species cost Victorians annually. In 2008 the SoE Report said pest plants and animals cost Victoria $900 million, but the 2018 SoE Report does not have a similar estimate. A 2018 study found that the mean cost of weed management in Australia was almost $5 billion (mostly due to spending by agriculture) (McLeod, 2018) and a 2014 study found that on average pest animals cost Australia $600 million (McLeod, 2016).

Without better information about the costs of invasive species, it is impossible to accurately budget for management activities or understand the extent of the problem. These costs need to be broken down into spending on the different phases of the invasion curve.

Funding

In Victoria funding for environmentally focused invasive species management is largely directed by DELWP's Strategic Management Prospects (SMP) system. This system uses modelled data to layer ecological information, including threatened species data and impacts by invasive species. It then introduces a 'cost effectiveness' measure to determine which actions would provide the most cost-effective outcome. While this method may be useful where good data exists to inform the models, we have already seen there is a lack of data for invasive species, meaning the system for determining funding is flawed.

Investment needs to be spread across all phases of the invasion curve, with strong investment needed in prevention and early action to limit future control costs.

5. TOR d: Legislative, policy, program, governance and funding solutions to facilitate ecosystem and species protection, restoration and recovery in Victoria, in the context of climate change impacts

Legislative solutions

A new Act

To facilitate ecosystem and species protection and restoration, it's vital to develop new stand-alone biosecurity legislation to strengthen the approach to harmful invasive species. The environment must be a central focus for this legislation, along with agriculture – a failing in the *Invasive Species Control Bill* in 2014.

Since 2014 the need for clear, effective, environmentally focussed invasive species legislation has only increased. An appropriate Act needs to incorporate the risk management and biosecurity approach outlined in the IPAPF to effectively prevent, eradicate and control invasive species that threaten the natural environment. This includes:

- A lead role for DELWP (or equivalent) and the Environment Minister in developing policy and administering legislation and policy for invasive species that threaten the natural environment (See Attachment 1 for more detail)
- A permitted 'safe' list approach to define which non-indigenous taxa (including species native to Australia but not to Victoria) can be introduced, sold, moved or kept in Victoria on the basis of risk assessment, with the precautionary principle applying where information is lacking
- A 'duty of care' obligation that requires all biosecurity participants to exercise a general biosecurity obligation to take reasonable and practical measures to prevent and minimise biosecurity risks

- Ecologically sustainable development as a guiding principle, which would also include the following sub-principles:
    - The precautionary principle
    - Conservation of biodiversity
    - Intergenerational equity
    - Valuation and pricing
    - Public participation
- An explicit commitment to prevention as a fundamental starting point for all biosecurity activities
- A requirement for systematic risk assessment and categorisation of already introduced species to guide actions to eradicate, contain or control harmful species
- An independent expert committee to advise on risk assessments, declarations and policy.

The proposed Act also needs to resolve any conflict between legislation that restricts the management of damaging invasive species. This includes – as a priority – reclassifying all species of deer listed as 'game' species under the Wildlife Act as pest species, starting with sambar deer (see the section on feral deer below). This would involve amending the CaLP Act and the Wildlife Act. This would align these Acts with Victoria's *National Parks Act 1975*, the FFG Act, the EPBC Act and Victoria's biodiversity strategy: *Protecting Victoria's Environment – Biodiversity 2037*.

Updating existing legislation

Other legislative solutions include adjusting the CaLP Act to better cover invasive native plant species, or include a similar initiative in a new Invasive Species Act. This is because several of the most serious invasive plant species in the state are indigenous to one area, but become serious threats to biodiversity when introduced into others.

Of the top 20 environmental weeds in Victoria, three are indigenous to Victoria but naturalised outside their pre-European range: sweet pittosporum, coast wattle and coast tea-tree. Sweet pittosporum is a major invader, causing significant damage to the forests right across the state including in the Dandenongs, Yarra Ranges and the Otways, far from its natural range. Coast wattle and coast tea-tree both invade areas outside their natural range. Listing these species under the CaLP Act would assist land managers to legally carry out ecological management, where appropriate.

Currently, listing is not possible as the CaLP Act has a clause that prohibits the listing of species that naturally occur in ecological communities listed under the FFG Act, and sweet pittosporum, coast wattle and coast tea-tree all occur within an FFG-listed community. To solve this issue, the Act should be updated to allow for appropriately identified native species to be listed under the CaLP Act so that harmful natives can be properly managed.

As previously mentioned, game animals such as deer, exotic quail and exotic pheasants currently cannot be listed as invasive, despite the environmental damage they cause and the need for a coordinated approach to their control. Listing them as invasive would require changes to the CaLP Act, the Wildlife Act and possibly the FFG Act – or else new provisions under the proposed Invasive Species Act. Listing of feral cats over selected public lands was put in place in July 2018 recognising their significant impacts.

In summary, to properly manage harmful invasive species any new legislation must enable any species and taxa native to Victoria, as well as game animals, to be listed.

Governance solutions

The mission, culture and priorities of the organisation responsible for responding to the invasive species threats is critical to effective action. Many of Victoria's invasive species responsibilities lie within Agriculture Victoria, an agency whose primary missions is supporting agriculture. While there are many overlapping invasive species threats in common between agriculture and the environment, there are also many that only impact the environment or directly conflict with agricultural interests. As a result, these environmental threats do not receive the attention they deserve. This agricultural emphasis continues at the national level where Victoria's interests at the key intergovernmental bodies, the National Biosecurity Committee and the agricultural ministers' forum, are represented by the agency and minister representing agricultural interests.

To support the establishment of a new Invasive Species Act, there needs to be a single entity or authority with an environmental mission that is responsible for managing invasive species. This entity would ensure the Act's ecological objectives were not overshadowed by agricultural or hunting interests. The entity's guiding principles would be the same as those listed for a new Invasive Species Act. Such an entity could be an existing environmental agency with broadened objectives, reporting to the minister for the environment.

Box 1: Why biosecurity should be administered by the environment department

1. **Biosecurity threats are greatest in the natural environment**: More invasive species threaten environmental values than agricultural values and the majority of newly establishing species are environmental rather than agricultural threats. Much less is known about environmental invaders and they are more difficult to manage. Without regulatory and policy authority for biosecurity, the environment minister is hobbled in his/her responsibilities to protect threatened biodiversity and mitigate threatening processes.
2. **The state has more biosecurity responsibilities in the natural environment than in primary industries**: The state has a larger role in managing environmental than agricultural invaders, because it is a large landholder, and because while there are commercial incentives for industry management of invasive species, environmental biosecurity relies on government and community investment for the public good.
3. **The agricultural department has conflicts of interest**: In some aspects of biosecurity, the agricultural department has conflicts of interest, including breeding and promotion of invasive plants for agriculture (eg. tall wheat grass) and stocking of invasive fish in waterways for fishing. Biodiversity conservation has not been a priority for the primary industries department.

As we have seen in states such as NSW, a regional approach to pest animal and weed management provides a more comprehensive approach to invasive species management. At present management arrangements on public land and private land in Victoria are not well integrated at the regional level. Some Victorian catchment management authorities achieve this integration, but there is no statewide governance arrangement that facilitates regional pest animal and weed planning and guarantees accountability.

The situation would be improved by the establishment of regional pest animal and weed committees comprising local governments, other land managers, Traditional Owners and community representatives to develop strategies and allocate resources for weed eradication and control. These committees would best operate at the catchment level, overseen by each catchment management authority.

Government agencies and their polices continue to exacerbate invasive species threats. There needs to be a process to ensure that government programs – including agricultural programs – do not promote invasive species that cause environmental harm. For example, Agriculture Victoria promotes tall wheat grass for saline areas, a species listed as a threatening process under the FFG Act.

The level of knowledge about invasive species within government can be improved. All public land managers must ensure they are adequately trained and operating to the relevant standards. This would include developing training and certification systems for weed control. These would be required for all workers and contractors involved with weed control on public lands, modelled on Agriculture Victoria's Weedstop Vehicle Hygiene Certified Program (http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/weedstop-vehicle-hygiene-program)

Funding solutions

Effective management of invasive species requires long-term funding allocated according to a transparent prioritisation process (determined using the biosecurity approach as outlined in the IPAPF). To ensure funding for invasive species management is effective we suggest the new Act includes:

- A mechanism for transparently documenting the costs of managing invasive species for ecological purposes (separate from agriculture) so costs can be better understood and included in budgeting projections
- Effective monitoring of invasive species management outcomes so that future funding increases or decreases are based on data

Funding for invasive species management should be allocated as a priority response to climate change impacts, including the 2019 bushfires.

Another high priority funding need is to expand community engagement programs and ecological monitoring to complement the government's efforts in managing invasive species. This may involve motivating the community, including private land managers, to actively identify issues and engage in their own management and monitoring.

6. TOR e: Opportunities to restore Victoria's environment while upholding First Peoples' connection to country, and increasing and diversifying employment opportunities in Victoria

Invasive species management provides a great opportunity to increase Indigenous connection with country, if meaningful engagement and community driven programs are supported.

Strategic pest plant and animal management is essential to restore the diversity and abundance of native species – ultimately improving the health of the landscape. First Peoples should be involved in identifying priority locations and species to manage, as well as involved in the physical management effort, if that aligns with their objectives. Many Traditional Owner organisations already have established their own on-ground land management teams. One example is the Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation's Narrap team who already actively manage their

own lands as well as work in partnership with other organisations like the Merri Creek Management Authority and Trust for Nature.

7. TOR f: Other related matters – specific priority issues related to invasive species management

We believe four key invasive species issues deserve priority attention: deer, horses, newts and the lack of data.

Deer

Deer are not native to Australia and have the potential to pose significant environmental and economic damage in Victoria. The population of three established exotic deer species – red, fallow and sambar – have expanded significantly in the past decade causing significant impacts, particularly to forest ecosystems and waterways and farming operations. Hog deer are well established in parts of Victoria, but are yet to significantly expand their range while chital and rusa deer are present in low numbers. These three species are present in NSW and if not contained there may ultimately spread into Victoria. Despite the severe damage they cause, Victoria does not classify any deer as a pest species, in contrast to most other states. Instead they are protected under the Wildlife Act.

Figure 5 shows 2020 mapping of the recorded locations for sambar, fallow, hog and red deer based on 2015 sightings. These maps provide some indication of the potential distribution for these deer but are likely to under-estimate the full extent of the deer species since their populations are likely to have expanded significantly since 2015.

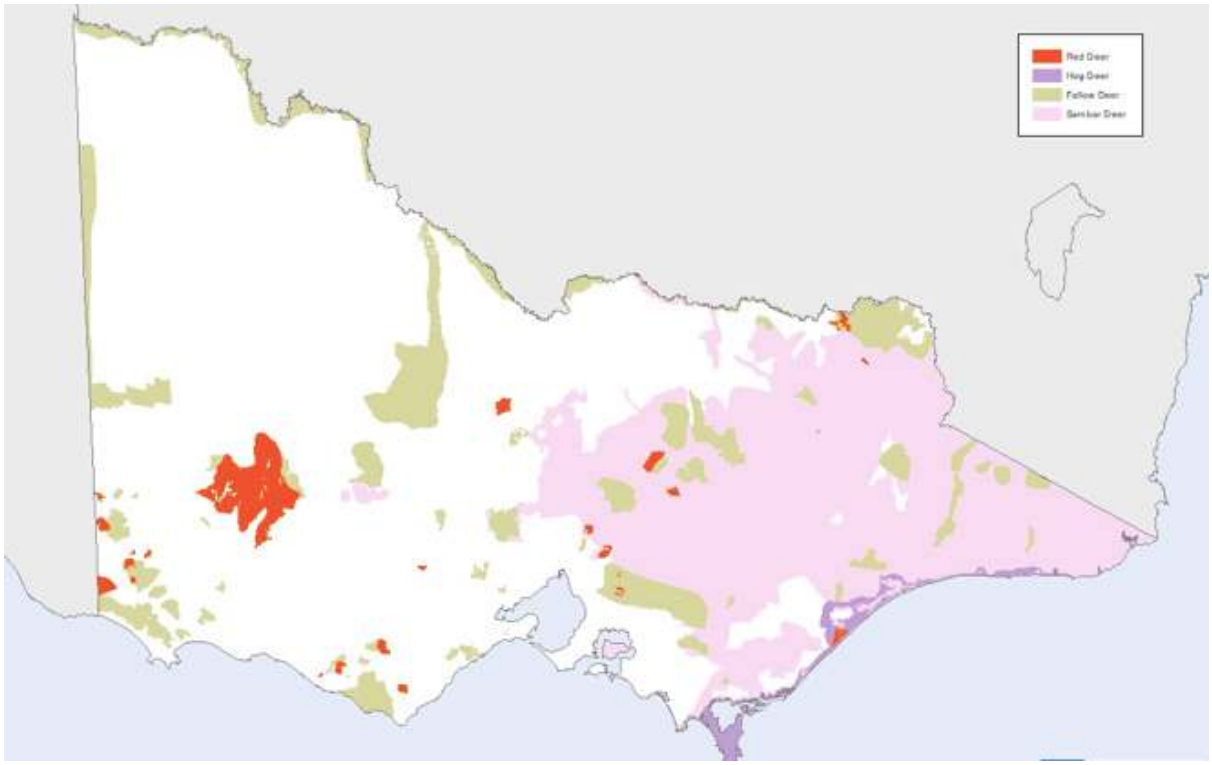

Figure 5: Estimated breeding populations of deer in Victoria (Victorian Deer Control Strategy 2020)

The Victorian Government's Deer Control Strategy was adopted in October 2020 and represents a significant shift of emphasis in addressing the state's growing feral deer population (DELWP 2020b). The draft strategy favoured the use of recreational hunting for managing deer while the new strategy seeks to address the environmental, agricultural and Aboriginal cultural impacts and requires a coordinated and integrated approach (DELWP and DEDJTR 2018). As the ENRRDC Inquiry into the Control of Invasive Animals on Crown Land and the government's response made clear, recreational hunting cannot meet the challenge of deer management ENRRDC 2017).

Recreational hunting is ad-hoc, dispersed and opportunistic, conducted by hunters with variable skill levels and often targeting trophy males. Restrictions such as bans on night hunting and the use of spotlights also limit its effectiveness (1SC 2012a). While skilled volunteer shooters can be helpful – if engaged under supervision – to assist with coordinated, strategic and supervised control efforts, as has occurred in the Dandenong Ranges and Yellingbo areas, and for feral goats in the Little Desert National Park, they should not be relied upon as a primary source of management, nor replace more effective programs such as those using professional shooters.

While the broad direction of the Deer Control Strategy is supported, the effectiveness will be determined by the speed, content and resources available for the proposed regional plans. There is no indication of which regions will be prioritised, beyond an initial one-million-dollar investment targeting the northern and eastern suburbs of Melbourne, nor the location of regional boundaries.

One important positive element of the regional plans is the designation of different management approaches for different locations that prioritise prevention, eradication, containment or asset protection. The highest priority within these plans should be given to prevention, localised eradication and containment where these gains can be sustained. All effort should prioritise the lowering impacts on high conservation areas, areas of Indigenous cultural heritage value, locations for minimising traffic accidents and limiting other damage.

We would favour the development of regional deer control plans that align with catchment management authority boundaries and integrated deer control with other pest management. The dominance of hunting and commercial interests in the plans and the regional groups tasked with the development of the plans should be avoided to prevent recreational and commercial objectives undermining science-based impact mitigation objectives.

While the strategy supports the declaration of yet-to-be-well established deer (chital, rusa, wapiti and sika) as pest species, the strategy does not propose pest designation for established deer species (hog, red, sambar and fallow). Pest species declaration sends an important message to the community that deer are having a negative impact and the pest status serves to encourage land managers to control rather than protect them. All other mainland states have designated all deer as a pest species. The strategy also retains protection of hog deer on private land despite their impacts and potential to spread.

Greater controls are also needed to prevent deer farm escapes and deliberate movement of deer by hunters, and there needs to be research on new control measures, including humane baits. The new strategy flags a review of deer farming to prevent accidental escapes and the investigation of control tools, but it is unclear at this stage if these initiatives will lead to any real improvements.

A national perspective is important in order to share deer control best practice guidelines, coordinate research effort and manage cross-border deer populations. The creation of the national deer coordinator and the proposed development of a national deer strategy are positive initiatives and need to be supported.

Feral horses

Feral horses, especially in alpine areas, are a priority for management. This is particularly important for protecting alpine and subalpine wetlands and waterways – refuges for vulnerable native species – considering the additional pressures of climate change and the recent Victorian bushfires.

For two decades feral horse population surveys in the Alpine National Park have shown that, without management control or severe natural events such as fire, feral horse populations can increase by 10 to 20% every year.

It is concerning that management programs, as outlined in the Feral Horse Strategic Action Plan 2018–2021*,* have been delayed by almost two years as the result of legal action brought against Parks Victoria by the Australian Brumby Alliance.

The plan commits to eradicating the Bogong population of approximately 100 horses. The plan also calls for the several thousand horses in the eastern Alps to be reduced by removing 400 horses per year. The delay in implementing the plan means valuable time has been lost and horse numbers have increased over the last two years, with the 2019 Alps horse count finding numbers had doubled since 2014. The removal rate of 400 per year may not be sufficient to lower the total population.

Since the court ruling in Parks Victoria's favour on 8 May 2020, Parks Victoria has sought to reinstate their horse removal program by using trapping and, in some high conservation value areas, ground shooting. However, the Australian Brumbies Alliance once again brought legal action against Parks Victoria, which failed in the Supreme Court on 22 May 2020. Ground shooting will now be used for high conservation areas, an initiative we strongly support and that needs to be routinely used where effective.

We support the Strategic Action Plan, Protection of Floodplain Marshes Barmah National Park and Barmah Forest Ramsar Site 2020–2023*,* which will reduce horse numbers in the Barmah forest over four years, with the long-term goal of eradication. Ideally eradication should take place within the four-year timeframe of the plan.

The Invasive Species Council supports feral horse management in all other areas continuing and accelerating, particularly while the impacts of the recent bushfires are still fresh and ongoing. We advocate aerial and ground shooting using professionals trained in RSPCA-approved methods.

Smooth newts

Smooth newts are classified as a Prohibited Pest Animal under the CaLP Act. A discrete population of smooth newts was identified in Melbourne's south-eastern suburbs in 2011. Four additional sites were identified in 2012, and another two uncovered in 2013 from e-DNA sampling conducted by Dr Reid Tingley of Melbourne University. Some sites were up to 5 km from the initial incursion.

An assessment by the Australian Government identified the smooth newt as having a 'moderate' invasive species risk, and concluded that impacts on native plants and animals were uncertain. Despite the risk, and the modest $300,000 estimated for their eradiation, the former Victorian Department of Environment and Primary Industries decided not to take any control action, considering the feasibility of eradication as 'low-moderate'.

However, experts recommend a preventative course of action. For the Invasive Species Council, this poor decision-making represents both the flaws in Australia's national biosecurity response systems

and the low priority given to stopping invasive species that harm the environment at the Federal and State levels.

In 2016 the Invasive Species Council commissioned its own survey work on the smooth newt thanks to the pro bono support from Ecology Australia. This survey found that the species was still present in at least one of the previous sites as well as a new site nearby.

Subsequent work in 2019 initiated by the Invasive Species Council, also led by Dr Reid Tingley, now at Monash University, and supported by Melbourne Water, the Lord Mayors Charitable Foundation and the Helen Macpherson Smith Trust, has sought to delimit the full extent of the smooth newt using e-DNA sampling. The results of this work will be finalised with further surveys during the 2020 spring breeding season.

If delimitation confirms that it remains feasible to eradicate the smooth newt, we propose Agriculture Victoria take immediate steps to eradicate smooth newt colonies from south-eastern Melbourne. Alternatively, a long-term containment program accompanied by studies to determine its long-term impacts should be given serious consideration.

Address data gaps

An important component in restoring Victoria's environment is to ensure we have the data needed to inform management approaches. The SoE Report makes it clear there are data gaps on the abundance and distribution of invasive species for:

- Freshwater plants and animals
- Terrestrial animals
- Deer populations and their distribution.

We believe there is also a lack of data for:

- Marine species
- Pathogens, including native pathogens such as myrtle wilt.

In addition, research into effective and humane control methods for invasive species such as deer needs to be a priority for Victoria, particularly species-specific baits.

8. Summary of recommendations

Implementing the following recommendations would see Victoria make strong progress towards reducing the impacts of invasive species. The following recommendations are largely a compilation of recommendations from previous submission by the Invasive Species Council (ISC 2012b, ISC 2013a, ISC 2013b, ISC 2016) and the Nature Conservation Review conducted by the Victorian National Parks Association (VNPA 2014). They summarise the key findings of this submission.

Recommendations for legislation, policy, governance and investment

1. Prepare new stand-alone best practice biosecurity management legislation, including the features outlined on page 9, Legislative solutions.

2. Designate lead responsibility for invasive species issues affecting the natural environment to the Environment Minister and his/her respective department rather than the Agriculture Minister and their department. Refer to Attachment 1 for further detail.
3. Wholly adopt the 'invasion curve' approach to invasive species management as the basis of developing appropriate programs for prevention, eradication, containment and asset-based protection. Spread investment across each of these phases with a particularly strong investment in prevention and early action to limit future 'in perpetuity' control costs.
4. Assess and identify all risks associated with invasive species is required. For environmental weeds, this would be largely informed by the Advisory List of Environmental Weeds in Victoria. Categorisation in accordance with the invasion curve and appropriate responses to each should follow. Where data gaps are encountered, these should be prioritised for research.
5. Audit all costs associated with invasive species management, particularly those attributable to the natural environment, to provide a base-line from which future budgets can be set.
6. Allocate an increased budget for invasive species, aiming for a measurable reduction in impacts upon Victoria's ecosystems and threatened species.
7. Direct investment towards invasive species at all stages of the invasion curve, and to all types of invasive species: weeds, pest animals, diseases, pest insects, terrestrial and freshwater.
8. Introduce a monitoring and reporting program that measures against a set of meaningful indicators.
9. Amend the Wildlife Act to exclude the listing of all game species as 'protected'.
10. Amend the CaLP Act to include the option of listing invasive native flora species.

Recommendations for deer

11. Resource and implement the Victorian Deer Control Strategy.
12. Priorities to implement under the Victorian Deer Control Strategy include:
    - Develop, resource and implement regional deer control plans that align with catchment management authority boundaries and integrate other pest animal control.
    - Designate the highest priority within regional plans to prevention, localised eradication and containment where these gains can be sustained.
    - Remove the regulatory barriers affecting the capacity of public land managers to control deer.
    - Increase penalties for illegal hunting and for the translocation of live deer.
    - Establish a state government Professional and Volunteer Firearms Competency Accreditation and a Peri-urban Firearms Protocol or Code of Practice to improve public safety and encourage humane control.
    - Ensure farmed deer are tagged, fences maintained to standards in accord with the Australian Deer Industry Manual no.2, Planning for Success and review penalties for con-compliance.
    - Set evidence-based targets for effective deer control.
    - Allocate adequate recurrent funding to public land managers for pest control operations.

- Build capacity in the professional pest control sector, including for remote area management and aerial shooting.
- Expand the engagement of professional and accredited recreational shooters in targeted programs managed by Parks Victoria.
- Work closely with the national deer coordinator to develop a national deer management plan that integrates with and supports the Victorian Deer Control Strategy.
- Support research into additional control methods, including the development of genetic and/or biological controls, baiting options, trapping and other remote area control possibilities.
- Resource an ongoing program to monitor:
    - Deer populations and distribution
    - The effectiveness of control and containment measures
    - The costs and impacts of deer populations on the environment, agriculture, the economy and the Victorian community.

Recommendations for feral horses

13. Continue and accelerate feral horse management in the alpine and sub-alpine areas, particularly as the impacts of the recent bushfires are still fresh and ongoing.
14. Utilise aerial and ground shooting professionals trained in RSPCA-approved methods as the primary methods of control.
15. Implement feral horse management in Barmah forest under the Strategic Action Plan, Protection of Floodplain Marshes Barmah National Park and Barmah Forest Ramsar Site 2020–2023, however aim to remove all feral horses during the four-year life of the plan.

Recommendations for smooth newt

16. After confirmation that eradication of the smooth newt remains feasible, eradicate smooth newt colonies from south-eastern Melbourne. If not, contain newt colonies while studies are undertaken to determine the likely environmental impacts of smooth newts.

Recommendations for research

17. Use the assessment of all invasive species (a 'legislation, policy, governance and investment' recommendation) to determine data gaps and use invasion curve priorities to inform research designed to address these gaps.
18. Ensure there is long-term budget allocation to fund meaningful invasive species research.

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ATTACHMENT 1 – Briefing paper: Why biosecurity should be administered by the environment department

Why biosecurity should be administered by the environment department

1. Biosecurity threats are greatest in the natural environment: More invasive species threaten environmental values than agricultural values and the majority of newly establishing species are environmental rather than agricultural threats. Much less is known about environmental invaders and they are more difficult to manage. Without regulatory and policy authority for biosecurity, the environment minister is hobbled in his/her responsibilities to protect threatened biodiversity and mitigate threatening processes.
2. The state has more biosecurity responsibilities in the natural environment than in primary industries: The state has a larger role in managing environmental than agricultural invaders, because it is a large landholder, and because while there are commercial incentives for industry management of invasive species, environmental biosecurity relies on government and community investment for the public good.
3. The agricultural department has conflicts of interest: In some aspects of biosecurity, the agricultural department has conflicts of interest, including breeding and promotion of invasive plants for agriculture (eg. tall wheat grass) and stocking of invasive fish in waterways for fishing. Biodiversity conservation has not been a priority for the primary industries department.

Differences between agricultural and environmental biosecurity

In many ways, environmental biosecurity is much more challenging than that needed for primary industries. Although many invasive species affect both agricultural and environmental assets and warrant a joint approach, protecting nature differs in many ways from protecting industry assets, including in the following ways.

The values to be protected: Conservation requires a biosecurity focus on the hundreds of thousands of species, and their populations and interactions that constitute ecosystems. In contrast, industry biosecurity is focused on protecting far fewer economically valuable species. The values at stake for industry are quantifiable in economic terms and often replaceable (by new breeds, species or enterprises). The values at stake in conservation are typically irreplaceable – each species and ecosystem is important – and 'there are no generally accepted methods for valuing' them.[1] This means they are more likely to be ignored or undervalued when biosecurity priorities are decided.

Scale and complexity of threats: Because of the diversity and complexity of the natural environment, there are far more invasive species that threaten or potentially threaten environmental values than production values. For example, a 2003 analysis found that about twice as many weed species were a 'major problem' in natural ecosystems (798 species) as were a major problem to agricultural enterprises (426 species).[2] The threats are often more complex, influenced by interactions between species, ecological processes (such as fire regimes) and other threats such as habitat fragmentation.

State of knowledge: The 2008 review of biosecurity found that 'Australia has a relatively poor knowledge of the biosecurity threats to its natural environment', largely due to 'the absence of

[1] Biosecurity Advisory Council. 2011. 'Biosecurity Advisory Council's detailed response', Advice provided to the Minister for Agriculture, Fisheries and Forestry, February 2011.

[2] Groves R, Hosking J, Batianoff G, et al. 2003. *Weed categories for natural and agricultural ecosystem management*. Bureau of Rural Sciences, Canberra.

commercial incentives' and low priority for government funding.[3] Much more is known about cultivated species and the invasive threats to them than about biodiversity and invasive species threats. [4]

Predictability and timeframes: While impacts on individual cultivated species can be predicted with reasonable accuracy, there are high levels of uncertainty in predicting impacts in the natural environment due to complex interactions, long timeframes and lack of knowledge. . Invasive impacts in the natural environment may not be observed for decades due to lag effects, lack of monitoring or their insidious nature. A cow killed by a new pathogen is much more easily detected than a dead bird in a forest. The combination of great uncertainties, long timeframes and limited management options warrants a highly precautionary approach.

Management approaches and options: There are many more management options in relatively simple, delimited agricultural systems than there are in complex natural environments. Weeds in agricultural systems are generally much more detectable than in complex habitats such as rainforest and weeds cannot be controlled with broadacre mechanical or chemical control in many natural situations. In response to the recently introduced myrtle rust, plant industries can use fungicides, breed resistant varieties or use tolerant species, none of which are options in the natural environment. There are commercial incentives for industry management of invasive species but environmental biosecurity relies on government and community investment for the public good.[5]

Stakeholders and resources: A multitude of stakeholders, often with conflicting agendas, make environmental biosecurity a much more socially and politically challenging policy area than industry biosecurity. Some of the most damaging environmental invaders are ignored because of economic or social reasons that are rarely subject to cost-benefit analysis – invasive pasture grasses, for example. Commercial incentives and government support also mean that industry biosecurity is better resourced than environmental biosecurity.

Some implications of these differences

- Biosecurity policy needs to be shaped by ecological principles and address biodiversity priorities, rather than be an add-on to agricultural biosecurity.
- Because of ecological uncertainties and limited management options, applying the precautionary principle is vital.
- Biosecurity policy units and advisory bodies need more ecologists and conservationists.
- Biosecurity should be a high and joint priority for both environmental and agricultural agencies.
- There needs to be more research into potential environmental invaders, the impacts of invasive species on biodiversity and their environmental management.
- The imbalance in resources for industry and environmental biosecurity needs to be redressed with increased public funds going to public good biosecurity priorities whilst maintaining competent industry biosecurity capacity.
- There is need for an environmentally meaningful way of quantifying and prioritising environmental threats and comparing threats across sectors.
- Post-border biosecurity needs to be much more preventive and ecologically defensive.
- Environmental biosecurity needs meaningful involvement of the community and environmental NGOs in policy development.

This briefing paper was originally prepared in March 2015 and provided to the incoming Victorian Labor government.

[3] Beale R, Fairbrother J, Inglis A, Trebeck D. 2008. O*ne Biosecurity – a working partnership*, Independent review of Australia's Quarantine and Biosecurity Arrangements, Report to the Australian Government.
[4] Burgman M, Walshe T, Godden L, Martin, P. 2009. Designing regulation for conservation and biosecurity. *Australasian Journal of Natural Resources Law and Policy* 13: 93-112.
[5] Beale R, Fairbrother J, Inglis A, Trebeck D. 2008. O*ne Biosecurity – a working partnership*, Independent review of Australia's Quarantine and Biosecurity Arrangements, Report to the Australian Government.

ATTACHMENT 2: Inquiry terms of reference

The terms of reference for the inquiry by the Environment and Planning Committee of the Victorian Parliament were established by the following motion of the Legislative Council passed on 30 October 2019.

The reporting date for the inquiry was subsequently extended to 30 April 2021.

Terms of Reference
That this House requires the Environment and Planning Committee to inquire into, consider and report, within 12 months, on the decline of Victoria's ecosystems and measures to restore habitats and populations of threatened and endangered species, including but not limited to —

a) the extent of the decline of Victoria's biodiversity and the likely impact on people, particularly First Peoples, and ecosystems, if more is not done to address this, including consideration of climate change impacts;
b) the adequacy of the legislative framework protecting Victoria's environment, including grasslands, forests and the marine and coastal environment, and native species;
c) the adequacy and effectiveness of government programs and funding protecting and restoring Victoria's ecosystems;
d) legislative, policy, program, governance and funding solutions to facilitate ecosystem and species protection, restoration and recovery in Victoria, in the context of climate change impacts;
e) opportunities to restore Victoria's environment while upholding First Peoples' connection to country, and increasing and diversifying employment opportunities in Victoria; and
f) any other related matters.